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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,519	01/07/2005	Ryoichi Shimoi	040302-0445	5840
22428 7590 12/04/2008 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007				
EXAMINER				
CRUPEAU, JONATHAN				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
12/04/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/520,519

**Applicant(s)**

SHIMO ET AL.

**Examiner**

Jonathan Crepeau

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses newly added claims 21-31. The claims are newly rejected under 35 USC 103, as necessitated by amendment. Accordingly, this action is made final.

### ***Claim Rejections - 35 USC § 103***

2. Claims 21-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 8-096820.

The reference teaches a fuel cell comprising a membrane electrode assembly and first and second separators having ribs forming gas flow channels. The ribs of both separator plates have one or a plurality of projections (246, 346, 446) on each rib (see Figs. 7, 9, and 11), which function to press the respective electrodes. Regarding claim 25, the projections can be formed along the entire length of the rib and are provided in parallel with each other on the rib in a longitudinal direction (see Fig. 8).

The reference does not expressly teach that a plurality of projections that differ in at least one of a height and a width are provided on the rib as recited in claims 21 and 27, or that at least one of a height and a width of the projection continuously changes along the direction of the rib as recited in claim 28.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because each of these recitations represents a

modification that is within the capabilities of a skilled artisan. As disclosed throughout the reference, the purpose of the invention of JP '820 is to enlarge the area of the gas diffusion electrode contributing to the electrochemical reaction by reducing contact pressure with the separator. The skilled artisan would be motivated to further modify the configurations shown in JP '820 in an attempt to further the purposes of the invention. For example, the artisan would be motivated to modify the projection(s) in an upstream-downstream direction (longitudinal direction) because it is known that reactant gas pressure is highest at the inlet of the flow field. To account for the flow field pressure drop, it would be obvious to use a graded projection on the rib to vary the electrode contact pressure, which is encompassed by the structures of instant claims 28-30. Further, the use of a plurality of projections differing in height or width arranged consecutively in a longitudinal direction along the rib (as recited in claim 26) would be obvious since this would involve configuring the single graded projection discussed above into several discrete projections, which would be within the skill of the art. It is further submitted that the claims reciting that only the height or width is changed are also obvious in light of this rationale. Accordingly, the claims are not considered to be distinguished over the reference.

### ***Response to Arguments***

3. Applicant's arguments filed August 14, 2008 have been fully considered but they are not persuasive. Applicants assert that "the ordinary artisan would not have had reason to modify JP 8-096820 according to the claims to obtain the feature of selective adjustment of gas diffusion inside an electrode." However, as stated above, the existence of pressure drops across fuel cell

flow fields is known and such knowledge would motivate the skilled artisan to modify the contact pressure of the projection(s) to account for the pressure drop. See Voss et al., U.S. Patent 5,441,819, at column 8, line 64 to column 10, line 4, for a discussion of pressure drop across fuel cell plates. Accordingly, as the pressure drop is a known phenomenon, the artisan would be motivated to modify the projection of JP '820 so that contact pressure between the projection and the electrode is steadily decreased in a downstream direction to allow for the less-pressurized gas to have easier access to the "compressed" portions of the gas diffusion electrode, and also to allow for the balancing of the gas diffusion characteristics over the entire surface of the electrode. As noted above, the disclosure of JP '820 is concerned with contact pressure and contact resistance of the separator and the electrode, and it would be well within the skill of the art to further modify JP '820 to include continuously changing projections (either as one or a plurality of projections) to attain the above-identified effects. Further, it has been held that choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success is generally within the skill of the art. *KSR v. Teleflex*, 82 USPQ2d 1385, 127 S. Ct. 1727 (2007). Applicant has not shown that use of the claimed configurations result in an unpredictable or unexpected difference from the prior art structure.

In addition, Applicant states that "in JP 8-096820, as the gas passages of the respective electrodes are straight-lined, the possibility that reaction gas might seep out at a winding portion of a porous electrode so as to flow from one winding portion to an adjacent winding portion and thus form a short-circuit would not have been recognized by the ordinary artisan." This

argument is noted, but is given little weight since the claims do not recite the "winding structure" and encompass any geometry of flow channels.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the

organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795  
December 4, 2008